

**AMENDMENTS TO THE CLAIMS**

- 1 1. (Currently Amended) A directory-enabled network element, comprising:  
2 a directory enabling element installed in and executed by the network element,  
3 wherein the network element is any one of a packet router and a data switch  
4 capable of manipulating packets at any of Open System Interconnection (OSI)  
5 Layer 2 and 3, wherein the directory enabling element is configured to query,  
6 access, and update directory information that is managed by a directory  
7 service of a network that includes the network element, wherein the directory  
8 service is any one of a Lightweight Directory Access Protocol (LDAP)  
9 directory and an X.500 directory;  
10 an application programming interface coupled to the directory enabling element and  
11 configured to receive directory services requests from application programs  
12 and provide the directory services requests to the directory enabling element,  
13 wherein the application programs are hosted in the network element; and  
14 a locator service coupled to the directory enabling element and accessible using the  
15 application programming interface and configured to enable the application  
16 programs to locate servers that provide the directory services in the network.

1 2. (Canceled)

1 3. (Canceled)

1 4. (Canceled)

1 5. (Currently Amended) A directory-enabled network element as recited in Claim 1,  
2 further comprising[:]  
3 ~~a directory enabling element installed in and executed by the network element, and~~  
4 ~~configured to query, access, and update directory information that is managed~~  
5 ~~by a directory service of a network that includes the network element;~~  
6 a bind service in the directory enabling element and coupled to a security protocol  
7 and configured to bind an external application program to the security  
8 protocol.

1 6. (Currently Amended) A directory-enabled network element as recited in Claim 21,  
2 further comprising a Unicode translation service configured to query, access, and  
3 update directory information that is encoded in a Unicode international character  
4 format.

1 7. (Currently Amended) A directory-enabled network element as recited in Claim 1,  
2 further comprising[:]  
3 ~~a directory enabling element installed in and executed by the network element, and~~  
4 ~~configured to query, access, and update directory information that is managed~~  
5 ~~by a directory service of a network that includes the network element;~~  
6 ~~a locator service coupled to the directory enabling element and configured to locate~~  
7 ~~servers that provide the directory services in the network;~~  
8 an event service coupled to the directory enabling element and configured to receive  
9 registration of an event and an associated responsive action from an

application program, notify the application program when the event occurs,  
and execute the associated responsive action in response thereto.

8. (Canceled)

9. (Currently Amended) A directory-enabled network element as recited in Claim 1,  
further comprising[[:] ]  
~~a directory enabling element installed in and executed by the network element, and~~  
~~configured to query, access, and update directory information that is managed~~  
~~by a directory service of a network that includes the network element;~~  
~~a locator service coupled to the directory enabling element and configured to locate~~  
~~servers that provide the directory services in the network;~~  
a group policy interface coupled to the directory enabling element and configured to  
receive and update the directory service with one or more definitions of  
directory services policies that apply to groups of network devices in the  
network.

10. (Currently Amended) A directory-enabled network element as recited in Claim 1,  
further comprising:  
~~a directory enabling element installed in and executed by the network element, and~~  
~~configured to query, access, and update directory information that is managed~~  
~~by a directory service of a network that includes the network element;~~

6 a bind service in the directory enabling element and coupled to an security protocol  
7 and configured to bind an external application program to the security  
8 protocol; and  
9 an event service coupled to the directory enabling element and accessible using the  
10 application programming interface and configured to receive registration of an  
11 event and an associated responsive action from an application program, notify  
12 the application program when the event occurs, and execute the associated  
13 responsive action in response thereto.

1 11. (Currently Amended) A directory-enabled packet router for a packet-switched  
2 network, wherein the packet router comprises a directory enabling element installed  
3 in and executed by the packet router, wherein the packet router is capable of  
4 manipulating packets at any of Open System Interconnection (OSI) Layer 2 and 3,  
5 wherein the directory enabling element is configured to query, access, and update  
6 directory information that is managed by a directory service of the packet-switched  
7 network, wherein the directory service is any one of a Lightweight Directory Access  
8 Protocol (LDAP) directory and an X.500 directory.

1 12. (Currently Amended) A directory-enabled packet router as recited in Claim 11,  
2 further comprising:  
3 ~~a directory enabling element installed in and executed by the router, and configured to~~  
4 ~~query, access, and update directory information that is managed by a directory~~  
5 ~~service of a network that includes the router;~~

6 a bind service in the directory enabling element and coupled to a security protocol  
7 and configured to bind an application program to the security protocol; and  
8 an event service coupled to the directory enabling element and accessible using the  
9 application programming interface and configured to receive registration of an  
10 event and an associated responsive action from an application program, notify  
11 the application program when the event occurs, and execute the associated  
12 responsive action in response thereto.

1 13. (Currently Amended) A directory-enabled network data switch for a packet-switched  
2 network, wherein the data switch comprises a directory enabling element installed in  
3 and executed by the data switch, wherein the data switch is capable of manipulating  
4 packets at any of Open System Interconnection (OSI) Layer 2 and 3, wherein the  
5 directory enabling element is configured to query, access, and update directory  
6 information that is managed by a directory service of the packet-switched network,  
7 wherein the directory service is any one of a Lightweight Directory Access Protocol  
8 (LDAP) directory and an X.500 directory.

1 14. (Currently Amended) A directory-enabled network data switch as recited in Claim  
2 13, further comprising:  
3 ~~a directory enabling element installed in and executed by the switch, and configured~~  
4 ~~to query, access, and update directory information that is managed by a~~  
5 ~~directory service of a network that includes the switch;~~  
6 a bind service in the directory enabling element and coupled to a security protocol  
7 and configured to bind an application program to the security protocol; and

an event service coupled to the directory enabling element and accessible using the application programming interface and configured to receive registration of an event and an associated responsive action from an application program, notify the application program when the event occurs, and execute the associated responsive action in response thereto.

15. (Canceled)

16. (Currently Amended) A computer-readable medium carrying one or more sequences of instructions for using a directory-enabled network element ~~to query, access, or update directory information of a directory service of a network that includes the directory-enabled network element~~, wherein execution of the one or more sequences of instructions by one or more processors causes the one or more processors to perform the steps of:

creating and storing a directory enabling element installed in and executed by the network element, wherein the network element is any one of a packet router and a data switch capable of manipulating packets at any of Open System Interconnection (OSI) Layer 2 and 3, and wherein the directory enabling element is configured to query, access, and update directory information that is managed by a directory service of a network that includes the network element, wherein the directory service is any one of a Lightweight Directory Access Protocol (LDAP) directory and an X.500 directory;  
binding ~~the~~ an application program to ~~the~~ a security protocol;

16 creating an event and an associated responsive action that are associated with the  
17 application program; and  
18 in response to occurrence of the event, executing the responsive action, obtaining  
19 policy information from the directory service, and converting the policy  
20 information into one or more commands that are executable by the directory-  
21 enabled network element.

1 17. (Original) A computer-readable medium as recited in Claim 16, wherein execution of  
2 the one or more sequences of instructions by one or more processors causes the one  
3 or more processors to perform the further steps of:  
4 locating a nearest directory server and binding the application program to the nearest  
5 directory server that is located;  
6 locating a nearest event server and binding the application program to the nearest  
7 event server that is located.

1 18. (Original) A computer-readable medium as recited in Claim 16, wherein execution of  
2 the one or more sequences of instructions by one or more processors causes the one  
3 or more processors to perform the further steps of:  
4 translating the policy information into one or more values that are ready to apply to a  
5 router, whereby a virtual private network is created between the router and  
6 another network device.

1 19. (Original) A computer-readable medium as recited in Claim 16, wherein execution of  
2 the one or more sequences of instructions by one or more processors causes the one  
3 or more processors to perform the further steps of:  
4 translating the policy information into one or more values that are ready to apply to a  
5 set of internal data structures of a router, by calling one or more internal NOS  
6 API functions, whereby a dynamic IPSEC configuration is created that  
7 connects the router and at least one other network device.

1 20. (Original) A computer-readable medium as recited in Claim 16, wherein execution of  
2 the one or more sequences of instructions by one or more processors causes the one  
3 or more processors to perform the further steps of establishing an application  
4 programming interface coupled to the directory enabling element and configured to  
5 receive directory services requests from application programs and provide the  
6 directory services requests to the one or more processors.

1 21. (Currently Amended) A directory services-enabled network element, comprising:  
2 a directory enabling element installed in and executed by the network element,  
3 wherein the network element is any one of a packet router and a data switch  
4 capable of manipulating packets at any of Open System Interconnection (OSI)  
5 Layer 2 and 3, wherein the directory enabling element is configured to query,  
6 access, and update directory information that is managed by directory services  
7 of a network that includes the network element, wherein the directory services  
8 include at least one of a Lightweight Directory Access Protocol (LDAP)  
9 directory and an X.500 directory; and



10 a locator service coupled to the directory enabling element and configured to locate  
11 servers that provide the directory services in the network.

1 22. (Currently Amended) A system comprising a network element enabled to  
2 automatically interface with directory services in a network, wherein the network  
3 element comprises:  
4 a directory enabling element installed in and executed by the network element,  
5 wherein the network element is any one of a packet router and a data packet  
6 switch capable of manipulating packets at any of Open System  
7 Interconnection (OSI) Layer 2 and 3, wherein the directory enabling element  
8 is configured to query, access, and update directory information that is  
9 managed by directory services of the network that includes the network  
10 element, wherein the directory services include at least one of a Lightweight  
11 Directory Access Protocol (LDAP) directory and an X.500 directory; and  
12 a locator service coupled to the directory enabling element and configured to locate  
13 servers that provide the directory services in the network.

1 23. (Previously Presented) The system of claim 22, wherein the network element obtains  
2 policy information from the directory services and updates the directory service.

1 24. (Previously Presented) The system of claim 22, wherein the network element  
2 includes a protocol agent for interfacing with the directory services.

1 25. (Canceled)

1 26. (Canceled)